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COMPARISON OF FRIEDEWALD AND BIOLOGIC LDL-C IN FAMILIAL HYPERCHOLESTEROLEMIA SCREENING: THE VERY LARGE DATABASE OF LIPIDS STUDY-17 (VLDL-17)

Poster Contributions
Hall C
Sunday, March 30, 2014, 9:45 a.m.-10:30 a.m.

Session Title: Prevention: Familial Hypercholesterolemia, Novel Therapies and Cardiovascular Risk
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Background: Familial hypercholesterolemia (FH) is an underdiagnosed autosomal dominant disorder characterized by defective LDL clearance, elevated LDL-C and premature coronary artery disease. The prevalence of heterozygous FH is approximately 1 in 300 to 500 persons worldwide. FH screening is based on Friedewald LDL-C (including biologic LDL-C + IDL-C + Lp(a)-C), though FH is fundamentally a disease of biologic LDL-C, which may be discordant with the Friedewald LDL-C.

Methods: We identified 1,320,582 individuals from the Very Large Database of Lipids who were referred from 2009-2011 for VAP testing and had data on Friedewald and biologic LDL-C. Friedewald LDL-C was defined as the cholesterol content of LDL, IDL, and Lp(a) with biologic LDL-C representing the LDL fraction. Using Friedewald LDL-C, we categorized patients by the National Lipid Association guidelines age-based screening thresholds for FH: ≥190 if aged <20, ≥220 mg/dL if aged 20-29, and ≥250 mg/dL if aged ≥30. In those meeting these criteria, we categorized patients using population percentile equivalent biologic LDL-C cutpoints, and compared patient-level concordance between population percentile units of Friedewald and biologic LDL-C.

Results: Overall, 3,829 (0.29%) of patients screened FH positive by Friedewald LDL-C, including 306/14,362 (2.13%) aged <20, 276/37,186 (0.74%) aged 20-29, and 3,247/1,269,033 (0.26%). Friedewald LDL-C cutpoints of 190, 220, and 250 mg/dL were equivalent to population percentiles of 97.1, 99.2, and 99.7, with equivalent biologic LDL-C cutpoints of 162, 188, and 213 mg/dL. Of those who screened FH positive by Friedewald LDL-C, 3,016/3,829 (78.8%) were above and 813/3,829 (21.2%) were below the population percentile equivalent biologic LDL-C cutpoints. The mean difference in Friedewald minus biologic LDL-C percentiles was -0.01 (SD, 0.17) in those who screened positive by both LDL-C parameters, and 1.92 (SD, 9.16) in those positive by Friedewald LDL-C but negative by biologic LDL-C.

Conclusion: In patients who screen positive by Friedewald LDL-C for FH, there is overall good concordance of Friedewald with biologic LDL-C, supporting use of the traditional LDL-C definition in FH screening.